

Application No.: 10/076005Case No.: 57321US002**Remarks**

Claims 1 to 35 and 53 to 60 have been pending. Claims 36 to 52 have been withdrawn from consideration. Claims 8 is being canceled. Claims 1, 9, 21, 27, 53, 54, 58, and 60 are being amended.

Applicants are hereby amending claims 1, 21, 53, 54, 58, and 60 to limit webs of film to webs of polymeric film (basis therefor being found, for example, in claim 8 (which is thus being cancelled), and at page 5, lines 11 – 16).

Claim 9 is hereby being amended to correct its dependency in view of the cancellation of claim 8, and claim 27 is being updated to reflect the amendment to claim 21.

**Restriction Requirement**

Restriction to one of the following groups of claims has been required under 35 U.S.C.

Section 121:

**Group I:** Claims 1 – 35 and 53 – 60, drawn to a deposition mask and deposition system, classified in class 118, subclass 720, or

**Group II:** Claims 36 – 52, drawn to a method of coating, classified in class 427, subclass 96+.

Applicants hereby affirm their provisional election with traverse to prosecute the Group I, claims 1 – 20 (which was made by telephone on May 1, 2003), now 1 – 35 and 53 – 60.

Applicants respectfully submit that the Restriction Requirement is improper for the following reasons. Since the two groups of claims relate to substituted pentacene compounds that are useful as semiconductors, the searches required will be substantially the same. A search for the compounds should also produce references concerning uses for the compounds. Searching both groups for a single patent application thus should not present an extra burden for the PTO. Applicants therefore respectfully request reconsideration and withdrawal of the Restriction Requirement.

Application No.: 10/076005

Case No.: 57321US002

**Objection to Informalities**

The disclosure is objected to because on page 10, line 25, "67provides" should read "67 provides" and on page 15, line 14, "ares" should read "areas".

Applicants have corrected the disclosure, and therefore respectfully requests that the objection be withdrawn.

**Rejections Under 35 U.S.C. Section 102**

Claims 1 – 3, 5 – 7, 13, 14, 19, 21 – 26, 28, 19, 34, 35, 53, 54, 56, and 57 were rejected under Section 102(b) as anticipated by U.S. Patent No. 4,369,730 (Izu et al.). The rejection is respectfully traversed for the following reasons.

Izu discloses a system for advancing a weblike metallic substance of material through a plurality of modules to produce a plurality of solar cells. The modules may comprise belt-like masks including a plurality of strips (for example, one inch wide) to expose strip-like areas across the width of the metallic substrate as it travels through the modules.

In amended claim 1, Applicants claim a repositionable aperture mask comprising: an elongated web of flexible polymeric film; and a deposition mask pattern formed in the film, wherein the deposition mask pattern defines deposition apertures that extend through the film that define at least a portion of an integrated circuit.

It appears that Izu fails to teach all of the limitations of claim 1. First, Izu does not appear to teach or suggest a deposition mask pattern formed in a web of film. The mask taught in Izu is comprised of a "plurality of strips" (column 3, lines 53 – 57). Even if these strips are considered to be a deposition mask pattern, they are not formed in a web of film; they appear to be formed of multiple webs of film.

Second, Izu does not appear to teach a deposition mask pattern wherein the pattern defines deposition apertures that extend through the film. An aperture is "[a]n opening, such as a hole, gap, or slit" (see, for example, the AMERICAN HERITAGE DICTIONARY, Houghton Mifflin, p. 84, N.Y. (1996)). Izu does not appear to teach or suggest an opening, such as a hole, gap, or slit that extends through a web of film. Izu appears to teach only a plurality of separate strips of film.

Application No.: 10/076005

Case No.: 57321US002

Furthermore, Applicants have amended claim 1 to limit the elongated web of flexible film to elongated webs of polymeric film. Izu does not appear to teach or suggest a deposition mask comprising an elongated web of polymeric film.

Amended claims 21, 53, and 54 each contain the limitation of a web of flexible polymeric film with at least one deposition mask pattern. As discussed above, Izu does not appear to teach or suggest a deposition mask comprising an elongated web of polymeric film.

For the foregoing reasons, claims 1, 21, 53, and 54 (and any claims dependent therefrom) are patentable over Izu. Applicants therefore respectfully request that the rejection under Section 102(b) based on Izu be withdrawn.

Claims 1 – 8, and 13 – 15 were rejected under Section 102(b) as anticipated by JP Patent No. 5-228669 (Kurihara et al.). The rejection is respectfully traversed for the following reasons.

Kurihara discloses an apparatus for fabricating a perforated web using irradiated light comprising an endless masking plate arranged above a continuously conveyed web. The masking plate has a plurality of apertures arranged in a predetermined pattern, and is adapted so as to be continuously circulated.

It appears, however, that Kurihara fails to teach all of the limitations of Applicants' claims. Applicants' repositionable aperture mask comprises a deposition mask pattern, wherein deposition apertures define at least a portion of an integrated circuit. Kurihara's masking plate does not appear to comprise apertures that define at least a portion of an integrated circuit. In fact, Kurihara's masking plate is used to transmit light to a web, wherein the energy of the light forms apertures or slits in the web. Kurihara's apertures, therefore, are purely for the transmission of light, and not for the deposition of at least a portion of an integrated circuit. Applicants therefore respectfully request that the rejection under Section 102(b) based on Kurihara be withdrawn.

Claims 1 – 7, 19, 21, and 28 – 30 were rejected under Section 102(b) as anticipated by "Flexible Thin-Film Transistors Stretch Performance, Shrink Cost" (Brody et al.). The rejection is respectfully traversed for the following reasons.

Brody discloses a process for fabricating thin film transistors on flexible substrates. The process comprises winding a roll of substrate through a vacuum-enclosed printer while transistor layers are deposited through a mask. Brody does not appear, however, to teach or suggest a

---

Application No.: 10/076005Case No.: 57321US002

---

deposition mask comprising an elongated web of polymeric film. Applicants therefore respectfully request that the rejection under Section 102(b) based on Brody be withdrawn.

Claims 1 – 4, 16, and 17 were rejected under Section 102(b) as anticipated by EP Patent No. 0 719 638 (Kinoshita). The rejection is respectfully traversed for the following reasons.

Kinoshita discloses a plastic mask for paste printing comprising a plastic sheet comprising at least one penetrating opening containing area that comprises at least one through-hole therein.

It appears that Kinoshita fails to teach all of the limitations of Applicants' claims. First, Kinoshita does not appear to teach or suggest an aperture mask comprising an elongated web of flexible film. Applicants' aperture mask comprises an elongated web of flexible film. "The elongated web may be greater than approximately 50 centimeters or greater than approximately 100 centimeters or greater than approximately 10 meters, or greater than approximately 100 meters in length . . . Aperture masks in this form can be used as part of an in-line deposition system." (Applicants' specification, page 2, lines 7 – 13.)

Second, Kinoshita does not appear to teach or suggest a deposition mask pattern that defines deposition apertures that define at least a portion of an integrated circuit. Kinoshita's masks appear to be used only to print paste (e.g., insulating paste or electroconductive paste). Applicants therefore respectfully request that the rejection under Section 102(b) based on Kinoshita be withdrawn.

Claims 1 ~ 6, 21, 26, 28 – 30, 34, and 35 were rejected under Section 102(b) as anticipated by U.S. Patent No. 6,440,277 (D'Amato). The rejection is respectfully traversed for the following reasons.

D'Amato discloses an apparatus for applying discrete area holograms directly onto web substrates in a continuous process. The apparatus includes a masking belt used to metallize continuous strips of micro-grooved devices on the web substrate. D'Amato, however, does not appear to teach or suggest a deposition mask pattern that defines deposition apertures that define at least a portion of an integrated circuit. D'Amato's masks appear to be used only to pattern a refractive or reflective coating on top of a holographic image in order to achieve viewability in light reflected from the hologram. Applicants therefore respectfully request that the rejection under Section 102(b) based on D'Amato be withdrawn.

---

Application No.: 10/076005Case No.: 57321US002

---

**Rejections Under 35 U.S.C. Section 103**

Claims 8, 9, 16, and 27 were rejected under Section 103(a) as being unpatentable over Izu in view of U.S. Patent No. 5,539,153 (Schwiebert et al.). The rejection is respectfully traversed for the following reasons.

Schwiebert discloses a process for attachment of solder bumps onto substrates comprising positioning a mask with a plurality of apertures on a substrate, applying solder paste to the mask, reflowing the paste to form solder bumps, and removing the mask after formation of the solder bumps.

The Examiner has asserted that Izu "differs from the present invention in that Izu does not teach that the mask is made out of a polymeric film" and that "[t]he motivation for making the mask of Izu out of polyimide, as taught by Schwiebert et al, is to provide a material of construction as required by Izu et al but not disclosed."

According to MPEP Section 2141.01(a), "[i]n order to rely on a reference as a basis for rejection of an applicant's invention, the reference must be either in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." Schwiebert is neither in Applicants' field of endeavor nor pertinent to the problem with which Applicants were concerned.

Schwiebert's field of endeavor is contained paste deposition in which a paste-like formulation is deposited onto a mask surface and "squeegeed" (that is, spread so that it fills each mask aperture) (see, for example, column 8, lines 3 – 18). In contrast, Applicants' field of endeavor is deposition techniques using aperture mask patterns to fabricate integrated circuits. Applicants were concerned with fabricating low-cost integrated circuits. Applicants' invention therefore includes aperture masks having patterns formed in one or more elongated webs of flexible polymeric film so that circuit fabrication processes can be performed in-line, and, in some instances, automated to reduce human error and increase throughput (see, for example, Applicants' specification, page 1, lines 18 – 27). Applicants' aperture masks can be used in a deposition process (for example, vapor deposition, e-beam evaporation, sputtering, and pulsed laser deposition) in which material is deposited onto a deposition substrate through the mask's deposition apertures to define at least a portion of a circuit. One skilled in the art of integrated

---

Application No.: 10/076005Case No.: 57321US002

---

circuit fabrication, and concerned with fabricating low-cost integrated circuits, would not turn to the art of contained paste deposition. Thus, the Examiner's reliance on Schweiert is improper.

Furthermore, assuming for the purposes of argument that the Examiner's reliance on Schweiert is proper, the Examiner has failed to establish a *prima facie* case of obviousness. According to MPEP Section 2143, to establish a *prima facie* case of obviousness, "the prior art reference (or references when combined) must teach or suggest all the claim limitations" and "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings."

First, the combination of Izu and Schweiert does not appear to teach or suggest all of Applicants' claim limitations. Contrary to the Examiner's assertion, Izu does not differ from the present invention merely in that Izu does not appear to teach or suggest polymers. As discussed above, Izu also differs from the present invention in that Izu does not appear to teach or suggest a deposition mask pattern wherein the pattern defines deposition apertures that extend through the film that define at least a portion of an integrated circuit. Schweiert does not appear to teach or suggest a deposition mask pattern wherein the pattern defines deposition apertures that extend through the film that define at least a portion of an integrated circuit. The Examiner has thus failed to establish the criteria for a *prima facie* case of obviousness that all claim limitation are taught or suggested.

Second, a suggestion or motivation to combine the references appears to be absent. The Examiner has asserted that the motivation is simply to provide a different material of construction. The Examiner has failed to provide any reason as to why one skilled in the art would be motivated to use a different material such as polyimide, and such motivation does not appear to be in the references. The mere fact that Izu and Schweiert could be combined does not render the resultant combination obvious unless the prior art also suggests the desirability of this combination.

Applicants suggest several advantages of polymer masks. For example, "the polymeric material that makes up the web of aperture masks may be well suited to be impregnated with magnetic material. In that case, the magnetic material may be used to reduce sag during the in-line deposition process, e.g., by application of attractive or repulsive magnetic force.

---

Application No.: 10/076005Case No.: 57321US002

---

Furthermore, polymeric material is often stretchable, which allows the mask to be stretched in order to better align the mask with the deposition substrate and possibly to control sag. Stretching techniques in the down-web direction, the cross-web direction, or both may be used to achieve quick and precise alignment of the elongated web of aperture masks relative to the elongated web of deposition substrate material." (Applicants' specification, page 3, lines 23 – 31.) However, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicants' disclosure. Thus, Examiner has also failed to establish the criteria for a *prima facie* case of obviousness that there be some suggestion or motivation to modify the reference or to combine reference teachings. Applicants therefore respectfully request that the rejection under Section 103 based on Izu in view of Schwiebert be withdrawn.

Claim 18 was rejected under Section 103(a) as being unpatentable over U.S. Patent No. Izu in view of JP 54-65764. The rejection is respectfully traversed for the following reasons.

JP 54-65764 discloses a calendaring device comprising a web that is a flexible polymer belt coated or impregnated with a coated film such as a magnetic layer.

The Examiner has asserted that "Izu et al differs from the present invention in that Izu et al does not teach that the flexible film is impregnated with a magnetic material" and that "JP 54-65764 teaches a flexible film web with impregnated magnetic material."

The Examiner has failed, however, to establish a *prima facie* case of obviousness because it appears that neither Izu nor JP 54-65764 teach or suggest all of Applicants' claim limitations. As discussed above, Izu does not appear to teach or suggest a deposition mask pattern formed in a web of film, nor does Izu appear to teach a deposition mask pattern wherein the pattern defines deposition apertures that extend through the film. JP 54-65764 does not appear to teach or suggest either of these claim limitations. Thus, the Examiner has failed to establish a *prima facie* case of obviousness, and Applicants respectfully request that the rejection under Section 103(a) based on the combination of Izu and JP 54-65764 be withdrawn.

Claims 10 – 12, 31, and 32 were rejected under Section 103(a) as being unpatentable over Izu. The rejection is respectfully traversed for the following reasons.

The Examiner has failed, however, to establish a *prima facie* case of obviousness because it appears that Izu does not teach or suggest all of Applicants' claim limitations. As discussed

Application No.: 10/076005

Case No.: 57321US002

above, Izu does not appear to teach or suggest a deposition mask pattern formed in a web of film, nor does Izu appear to teach a deposition mask pattern wherein the pattern defines deposition apertures that extend through the film. In addition, Izu does not teach or suggest a mask comprising a polymer film. Thus, the Examiner has failed to establish a prima facie case of obviousness, and Applicants respectfully request that the rejection under Section 103(a) based on Izu be withdrawn.

Claims 20 and 33 were rejected under Section 103(a) as being unpatentable over Izu in view of U.S. Patent No. 6,259,408 (Brady et al.). The rejection is respectfully traversed for the following reasons.

Brady discloses a method for making a radio frequency transponder comprising screening an antenna pattern onto a substrate by extruding conductive paste through a screening mask.

The Examiner has asserted that "Izu et al differs from the present invention in that Izu et al does not teach depositing an RFID" and that "Brady et al teaches a method for forming an RFID circuit using a mask."

First, for the same reasons that Schwiebert is not a proper reference, Brady is not a proper reference. Brady, like Schwiebert, is related to contained paste deposition. As discussed above, one skilled in the art of integrated circuit fabrication, and concerned with fabricating low-cost integrated circuits, would not turn to the art of contained paste deposition. Thus, the Examiner's reliance on Brady is improper.

Assuming, however, that the Examiner's reliance upon Brady is proper, the Examiner has failed, however, to establish a prima facie case of obviousness because it appears that neither Izu nor Brady teach or suggest all of Applicants' claim limitations. Neither appear to teach or suggest a deposition mask pattern formed in a web of polymeric film, or a deposition mask pattern wherein the pattern defines deposition apertures that extend through the film. In addition, Brady is using a mask only to provide an antenna for an RFID circuit. Brady does not teach or suggest using a mask to define circuit elements of a RFID circuit. Thus, the Examiner has failed to establish a prima facie case of obviousness, and Applicants respectfully request that the rejection under Section 103(a) based on the combination of Izu and Brady be withdrawn.

Claim 55 was rejected under Section 103(a) as being unpatentable over Izu in view of U.S. Patent No. 5,534,969 (Miyake). The rejection is respectfully traversed for the following reasons.

Application No.: 10/076005

Case No.: 57321US002

Miyake discloses an alignment method and a positioning apparatus including sensors that enables alignment between a photomask and a large substrate.

The Examiner has asserted that "Izu et al differs from the present invention in that Izu et al does not teach one or more sensors to sense whether the mask is aligned with the substrate" and that "Miyake teaches an alignment apparatus that includes sensors 9 that sense whether the mask is aligned with the substrate."

The Examiner has failed, however, to establish a *prima facie* case of obviousness because it appears that neither Izu nor Miyake teach or suggest all of Applicants' claim limitations. As discussed above, Izu does not appear to teach or suggest a deposition mask pattern formed in a web of polymeric film, or a deposition mask pattern wherein the pattern defines deposition apertures that extend through the film. Miyake teaches the use of polymeric photomasks, and does not appear to teach or suggest aperture masks. Photomasks, however, are very different than aperture masks. Photomasks are typically a clear sheet of plastic with a pattern of ink printed or drawn on it. The pattern on the photomask is transferred to a photosensitive surface of a substrate by utilizing a light exposure technique. Thus, the Examiner has failed to establish a *prima facie* case of obviousness, and Applicants respectfully request that the rejection under Section 103(a) based on the combination of Izu and Miyake be withdrawn.

Claims 58 – 60 were rejected under Section 103(a) as being unpatentable over Izu in view of "The TFT – A New Thin-Film Transistor" (Weimer). The rejection is respectfully traversed for the following reasons.

Weimer discloses a technique for fabricating thin film transistors comprising depositing electrodes and semiconductor patterns through movable masks.

In contrast, Applicant discloses a system comprising: a first web of film; a second web of polymeric film, wherein the second web of film is formed with a number of deposition mask patterns; a first stretching mechanism to stretch the first web of film in a down-web direction; a second stretching mechanism to stretch the second web of film in a down-web direction, wherein the down-web direction of the second web of film is different from the down-web direction of the first web of film, wherein stretching the first and second webs of film aligns a deposition mask pattern of the second web of film with the first web of film for a deposition process; and a

Application No.: 10/076005

Case No.: 57321US002

deposition unit to deposit material through the deposition mask patterns onto the first web of film.

Applicant also discloses a system comprising: a first web of film; a second web of polymeric film, wherein the second web of film is formed with a number of deposition mask patterns; a first stretching mechanism to stretch the first web of film in a cross-web direction; a second stretching mechanism to stretch the second web of film in a cross-web direction, wherein the cross-web direction of the second web of film is different from the cross-web direction of the first web of film, wherein stretching the first and second webs of film aligns a deposition mask pattern of the second web of film with the first web of film for a deposition process; and a deposition unit to deposit material through the deposition mask patterns onto the first web of film.

The Examiner has failed, however, to establish a *prima facie* case of obviousness because it appears that neither Izu nor Weimer appear to teach or suggest all of Applicants' claim limitations. Neither Izu nor Weimer appear to teach stretching mechanisms. Weimer teaches a movable glass substrate and a movable mask, but does not appear to teach or suggest stretching either the movable glass substrate or the movable mask. Thus, the Examiner has failed to establish a *prima facie* case of obviousness.

In addition, neither Izu nor Weimer appear to teach or suggest a web of polymeric film, wherein the web of film is formed with a number of deposition mask patterns. Applicants, therefore, respectfully request that the rejection under Section 103(a) based on the combination of Izu and Weimer be withdrawn.

**Concluding Remarks**

Reconsideration and allowance of Applicants' claims are respectfully requested.

Application No.: 10/076005

Case No.: 57321US002

Respectfully submitted,

April 5, 2004

Date

By: Lisa P. Fulton  
Lisa P. Fulton, Reg. No.: 55,195  
Telephone No.: (651) 733-1260Office of Intellectual Property Counsel  
3M Innovative Properties Company  
Facsimile No.: 651-736-3833